

**REMARKS**

The present application was filed on July 10, 2003 with claims 1 through 21. Claims 2, 6, 10-13, 16 and 18 have been previously canceled without prejudice. Claims 10-13 had been withdrawn from consideration in response to a restriction requirement. Therefore, claims 1, 3-5, 7-9, 14, 15, 17 and 19-21 are presently pending in the above-identified patent application. Applicant herein proposes to amend claims 1, 14 and 21. Support for the amendments can be found, for example, on page 5, lines 3-4, page 8, lines 18-21, and page 8, line 18 through page 9, line 10. No new matter is being introduced.

In the Office Action, the Examiner rejected claims 1, 3-5, 7-9, 14-15, 17 and 19-21 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, and rejected claims 1, 3-5, 7-9, 14-15, 17, and 19-21 under 35 U.S.C. §103(a) as allegedly being unpatentable over Eisenberg et al. (Nature, volume 299, 1982, pages 371-274) (hereinafter "Eisenberg") in view of Silverman (PNA; April 24, 2001; volume 98, pages 4996-5001) (hereinafter "Silverman") in view of Platt et al. (US Patent 5,784,294; issued 21 July 1998; filed 9 June 1995) (hereinafter "Platt").

The comments of the Examiner in forming the rejections are acknowledged and have been carefully considered.

Section 112, Second Paragraph, Rejection

Also, the Examiner rejected claims 1, 3-5, 7-9, 14-15, 17 and 19-21 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On page 3, the Office Action stated that

[i]ndependent claims 1, 14, and 21 each recite that “wherein each residue centroid having a same fractional distance to a surface of the tertiary protein structure as one or more additional residue centroids” wherein it is unclear as to the metes and bounds of a distance being measured in the same way (i.e. with the same dimensional units) as a centroid itself. For the purpose of examination, it will be interpreted that the same fractional distance is between the fractional distances of the questioned residue centroid from the center of the protein to the surface and the fractional distances of each of the one or more residue centroids from the center of the protein to the surface.

Applicant respectfully submits that the amendment to claims 1, 14 and 21 to include the aspect of “mapping each ellipsoidal coordinate onto a sphere with radius equal to a major principal axis if a residue centroid has a same fractional distance from a center of the protein structure to the ellipsoidal surface of the tertiary protein structure as one or more additional residue centroids, wherein mapping places each residue at a same distance from the center of the protein structure to enable that each such residue that has the same fractional distance from the center of the protein structure contributes an equivalent magnitude to the global linear hydrophobic moment” overcomes the above-noted issue. Support for the amendment can be found, for example, on page 8, lines 18-21.

Also, on page 3, the Office Action stated that

[i]ndependent claims 1, 14, and 21 continue to recite that the equivalent magnitude associated with fractional distances is accomplished by a *mapping* procedure. It is unclear as to the metes and bounds of this mapping procedure (i.e. it is unclear as to the metes and bounds of residues being mapped to other locations within the protein). (Emphasis in original)

Applicant respectfully submits that the amendment to claims 1, 14 and 21 to include the aspect of “using the first-order hydrophobic moment and the enhanced correlation between residue centroid magnitude and residue solvent accessibility to calculate the global linear hydrophobic moment comprises measuring a fractional

distance of each residue centroid to an ellipsoidal surface of the tertiary protein structure, and mapping each ellipsoidal coordinate onto a sphere with radius equal to a major principal axis if a residue centroid has a same fractional distance from a center of the protein structure to the ellipsoidal surface of the tertiary protein structure as one or more additional residue centroids, wherein mapping places each residue at a same distance from the center of the protein structure to enable that each such residue that has the same fractional distance from the center of the protein structure contributes an equivalent magnitude to the global linear hydrophobic moment” overcomes the noted issue. Support for the amendment can be found, for example, on page 8, line 23 through page 9, line 10.

Additionally, on page 3, the Office Action stated that

[i]ndependent claims 1, 14, and 21 also recite that the first hydrophobic moment and the enhanced correlation between residue centroid magnitude and residue solvent accessibility are used to **define** a global linear hydrophobic moment. This limitation is indefinite because it is unclear as to the metes and bounds of a first hydrophobic moment and the enhanced correlation **defining** a global linear hydrophobic moment; the limitation is interpreted as (and would be clearer if it is amended to recite) a first hydrophobic moment and the enhanced correlation **calculating** a global linear hydrophobic moment. (Emphasis in original)

Applicant respectfully submits that the amendments to claims 1, 14 and 21 overcome the above-noted issue. Support for the amendment can be found, for example, on page 5, lines 3-4.

Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1, 3-5, 7-9, 14-15, 17 and 19-21 under 35 U.S.C. §112, second paragraph.

#### Section 103(a) Rejection

The Examiner also rejected claims 1, 3-5, 7-9, 14-15, 17, and 19-21 under 35 U.S.C. §103(a) as allegedly being unpatentable over Eisenberg in view of Silverman in view of Platt. Applicant initially notes that a proper *prima facie* case of obviousness requires that the cited references combined must “teach or suggest all the claim limitations,” and that there be some suggestion or motivation, either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references or to modify the reference teachings. See MPEP §706.02(j). However, Applicant respectfully submits (as detailed below) that the cited combination of references does not teach or suggest all of the limitations of the claims.

5 Applicant respectfully re-submits that the cited references do not teach or suggest the aspects of using first-order hydrophobic moment and the enhanced correlation between residue centroid magnitude and residue solvent accessibility to calculate the global linear hydrophobic moment. On page 11, the Office Action states that

10 Applicant additionally argues that the instant reference does not teach that when a pair of centroids has the same fractional distance to the surface of the protein, each member of the pair must contribute the same magnitude to the linear moment. However, this argument is not persuasive because the limitation is met in Eisenberg et al. and Silverman. The instantly amended claim does not require that if each member of the  
15 pair of residue centroids were to HAVE a same fractional distance to a surface of the tertiary protein, each member of the pair would contribute an equivalent magnitude to the global linear hydrophobic moment by mapping. Instead, the instantly amended claim recites “wherein each residue HAVING a same fractional distance to a surface of the tertiary  
20 protein structure... contributes an equivalent magnitude to the global linear hydrophobic moment by mapping...” As no one of the residue centroids of Silverman (i.e. Figure 3) has the same exact fractional distance as a second residue centroid, this limitation is met in Eisenberg et al, and Silverman (i.e. because not two residues have the exact same fractional  
25 distance, there is no mapping to be carried out).

Applicant respectfully submit that the amendments to independent claims 1, 14 and 21, including the aspect of “mapping each ellipsoidal coordinate onto a sphere with radius equal to a major principal axis if a residue centroid has a same fractional distance  
30 from a center of the protein structure to the ellipsoidal surface of the tertiary protein structure as one or more additional residue centroids, wherein mapping places each residue at a same distance from the center of the protein structure to enable that each such residue that has the same fractional distance from the center of the protein structure contributes an equivalent magnitude to the global linear hydrophobic moment.” Support  
35 for the amendment can be found, for example, on page 8, line 18 through page 9, line 10.

Applicants submit that the cited references do not teach or suggest the mapping procedure (as detailed in claims 1, 14 and 21) if a residue centroid were to have a same

fractional distance to an ellipsoidal surface of the tertiary protein structure as one or more additional residue centroids. Consequently, Applicants respectfully assert that the cited references, both alone and in combination, fail to teach the noted claimed aspect. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Applicant respectfully submits that the combination of references does not teach or suggest the limitations in question, and therefore, that the §103 rejection is improper. Also, Applicant further submits that by virtue of their dependence on independent claims 1 and 14, claims 3-5, 7-9 and 15, 17-20, respectively recite patentable subject matter in their own right. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, Applicant respectfully requests withdrawal of the §103(a) rejection from claims 1, 3-5, 7-9, 14, 15, 17 and 19-21.

All of the pending claims, i.e., claims 1, 3-5, 7-9, 14, 15, 17 and 19-21, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

Respectfully submitted,



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